EM PROGRESS
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A REPORT FROM THE U.S. DEPARTMENT OF ENERGY'S OFFICE OF ENVIRONMENTAL MANAGEMENT

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WIPP Fills Its First Disposal Panel

In March, the Waste Isolation Pilot Plant (WIPP) completed a major step in the Department of Energy's (DOE) mission to dispose of the nation's transuranic (TRU) waste with final waste emplacement into the first of eight disposal panels of the repository. A Panel consists of a group of seven rooms designed for the permanent underground disposal of transuranic waste.

Once Panel 1 was filled, the facility immediately began disposal operations into Panel 2 with no down time resulting from the transition. WIPP crews are actively mining the repository's Panel 3 disposal area so it will be completed by the time Panel 2 is full, which is expected in late 2004. This schedule minimizes the maintenance the panels require prior to being used.

WIPP is located in southeastern New Mexico and administered by the Carlsbad Field Office (CBFO). Over its lifetime the project is expected to receive about 37,000 TRU shipments of waste from DOE sites across the nation. WIPP began accepting waste in March 1999.

Two TRU waste characterization trailers await drums in this staging area at the Savannah River Site.

For more information, contact Dennis Hurtt at (505) 234-7327.

Rocky Flats Cleanup Exceeds 50% Completion

Thanks to innovation and hard work in 2002, cleanup of the Rocky Flats site is more than 50% complete.

"The landscape of Rocky Flats is changing every day," said Rocky Flats Manager Gene Schmitt. "More fences, structures and buildings are coming down, waste is being packaged and shipped at unprecedented rates, and more environmental remediation is being completed than ever thought possible just a few years ago." Schmitt added that the progress achieved during 2002 moves the site ever closer to the goal of transitioning to the Rocky Flats National Wildlife Refuge.

"We are running under the total projected cost and are ahead of schedule," said Kaiser-Hill President and CEO Alan Parker. "Completion of our many milestones last year is a great tribute to the ingenuity and determination of the entire Rocky Flats workforce." Parker stressed that innovative strategies and safe work practices continue to be paramount to the overall success of the closure project. Kaiser-Hill, the prime contractor in charge of cleanup and closure, saved more than $100 million in 2002 while staying ahead of milestones.

The key accomplishments for 2002 includes the following:

- Workers packaged plutonium metals and oxides into more than 1,200 of 1,950 long-term storage containers. Shipments are on schedule to the Savannah River Site in South Carolina, a critical milestone toward site closure.
- Rocky Flats continued to ship more transuranic waste to the Waste Isolation Pilot Plant (WIPP) than ever before, disposing of 3,486 cubic

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In This Issue...

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Accelerated Process Lines Project: A WIPP Success Story

The Accelerated Process Lines Project (APL) is an important part of the Waste Isolation Pilot Plant's (WIPP) mission and one of the Carlsbad Field Office's (CBFO) greatest success stories. The project has successfully increased the number of shipments of transuranic (TRU) waste from Department of Energy (DOE) waste generator facilities to WIPP. APL mobile units are designed for deployment at DOE TRU waste generator sites to characterize, certify and ship waste to WIPP. The units include waste characterization systems and TRUPACT-II (TRU waste shipping containers) mobile loading units.

Since the project was conceived by Dr. Inés Triay, the CBFO Manager, APL systems have begun operating at the Savannah River Site (SRS), the Nevada Test Site (NTS) and Argonne National Laboratories-East (ANL-E). Approval of the process and authorization to ship has been obtained at SRS and NTS and is pending for ANL-E.

The process begins with APL personnel determining the properties of the waste stream based on historical documentation of the processes that generated the waste. This is called "Acceptable Knowledge" and is the basis for waste characterization. They then use the processes of real-time radiography (an x-ray of the contents), non-destructive assay (radiological properties) and headspace gas analysis (hazardous gases in the airspace of the drum) to confirm what was learned from the Acceptable Knowledge process. Data generated at each level of analysis is reviewed for containers and batches of containers according to a strict quality assurance program that certifies individual containers for disposal at WIPP.

The APL mobile characterization systems use a central project office and mobile TRUPACT-II loading teams to provide the infrastructure for multiple programs and to make the entire process more efficient with multiple DOE sites. By doing this, the APL has increased SRS's waste shipments to WIPP from a baseline of one shipment per month to the current level of 16 shipments per month. As of April 28, 2003, the APL program had completed 100 shipments, containing over 2500 drums, to WIPP.

The program is expediting the cleanup of two generator facilities: the Mound facility in Ohio and SRS in South Carolina. Mound is authorized by the state of South Carolina to ship waste to SRS under the condition that for every drum of waste Mound ships to SRS, SRS must ship two drums to WIPP. The APL will complete all the shipping commitments from SRS to WIPP by May 31, 2003. This will allow Mound to complete the final TRU waste shipment in June 2003.

The APL team looks to duplicate this project's success at other generator facilities while working to further increase the SRS shipment rate to WIPP. The APL project continues to exemplify DOE's commitment to environmental restoration and accelerating cleanup.

For more information, contact Dennis Hurtt at (505) 234-7327.

Six Pack Demolition at Savannah River

The Savannah River Site (SRS) has recently taken on the challenge of decommissioning more than 150,000 square feet of contaminated facilities in less than 18 months. This project, known as the "Six Pack," consists of six buildings in the M Area. It is the largest decommissioning project ever undertaken at SRS and is managed by BWXT Savannah River Company, part of the Westinghouse Savannah River Company.

One building has been demolished, a second is in progress and a contract has been awarded to demolish a third. Three others are scheduled to come down by April 2004.

Part of the challenge is to dispose of more than six million pounds of depleted uranium, which is stored in three buildings in the M Area. The material is being transported to Envirocare in Utah, an effort expected to conclude later this spring.

After the Six Pack decommissioning is complete, the rest of M Area will be demolished.

The Six Pack project is part of many "skyline" changes taking place at Savannah River to reduce the footprint of past activities and complete cleanup of SRS.

For more information, contact Fran Poda at (803) 208-3925.

DWPF Melter Operations Begin Anew at SRS

The Savannah River Site's Defense Waste Processing Facility (DWPF) recently began full-scale operation of its second melter, pouring radioactive glass on March 29, 2003. The first canister of vitrified waste was completed March 30, 2003. The melter converts the Site's high-level waste into a solid glass form (vitrified) suitable for long-term storage and disposal.

The $20 million, 65-ton new melter, which is the heart of DWPF operations, was installed in January 2003 during a six-month scheduled outage, and underwent startup tests and a gradual heat-up until operations began in late March. All operations were conducted remotely to protect workers from radiation.

DWPF's first melter operated continuously for more than eight years, including six years of radioactive operations – more than three times its design life. It produced more than 1,300 waste glass canisters—more than one quarter of the waste projected to be vitrified at SRS.

By safely extending the original melter's useful life, SRS has saved millions in taxpayer dollars and stays on course to empty its high level waste tanks. The site operated the first melter as long as possible, giving engineers a chance to observe how it faltered in its later life and to learn what to look for in future melter operation.

"The successful completion of the first-ever melter replacement is a remarkable achievement, reflecting excellent work planning and execution," said Bill Spader, DOE-SR Deputy Assistant Manager for High Level Waste.

To save time and money during future outages, the site replaced the facility's 1980s vintage control room equipment with a more modern Distributed Control System. Other obsolete equipment was also replaced during this outage, making the facility more viable for long-term operations.

For more information, contact Fran Poda at (803) 208-3925.

After eight years of continuous service (more than three times its design life), the old melter is passed by the new one.

DOE Creates Office of Legacy Management

Beginning October 1, 2003, the Department of Energy (DOE) will have a new office that will oversee sites that have been closed and no longer support DOE's ongoing national security, energy and science missions. The new Office of Legacy Management (LM) will be a stand-alone program secretarial office that will report directly to the Under Secretary of Energy.

"The establishment of the Office of Legacy Management demonstrates DOE's continued commitment to manage sites where active remediation has been completed," Secretary of Energy Spencer Abraham said. "The establishment of this new office is a significant step to ensuring the long-term protection of human health and the environment."

The office's primary functions will include: management of the land and associated resources, surveillance and maintenance associated with environmental remedies, records and information management, and the management of post-closure liabilities. The sites transferring to LM's authority will include: Environmental Management (EM) closure sites (Pinellas Plant, Weldon Spring Site), Uranium Mill Tailings Radiation Control Act sites, and Formerly Utilized Sites Remedial Action Program sites where remediation is complete. As more sites are successfully remediated and closed by EM, site surveillance and maintenance functions, and worker benefits as appropriate, will be transferred to the new office for long-term management.

Further details and the complete proposed legacy management budget are available at http://www.cfo.doe.gov/budget/04budget/content/otherdef/lm.pdf.

Canyon Makes History In South Carolina

Canyons in South Carolina? There are two at the Savannah River Site (SRS). And one recently made SRS history.

Chemical separations facilities are called "canyons" because of their long, narrow shape. F Canyon has completed its scheduled operations and is undergoing suspension. All materials are being dispositioned from the canyon.

The last remaining highly radioactive material in F Canyon was 30,000 gallons of Americium/Curium (Am/Cm). In late January, that material was successfully transferred from F Canyon, through more than two miles of pipe to H Area Tank Farm.

The transfer was significant because it was the first time such a large amount of material was transferred from the canyon at one time. In the past, the system and the controls in place allowed for only small amount of material to be transferred at once. After two years of work to change those constraints, and an enormous amount of teamwork, the transfer took place seamlessly, more than two months ahead of schedule. Cold runs were conducted late last year to ensure all facility modifications and other changes were working as designed.

The material is now in H Area Tank Farm's tank 51, where it will be part of the next large sludge batch to be vitrified in the Defense Waste Processing Facility. The successful transfer is a major step for F Canyon's suspension efforts, says Westinghouse Savannah River Company's Acting Chief Closure Officer Bill Johnson. "Transferring the Am/Cm material is a significant milestone that will help ensure successful suspension of the canyon, and is a major step forward in our goal of accelerated closure and risk reduction."

For more information, contact Fran Poda at (803) 208-3925.

Rocky Flats Cleanup, *continued from page 1*

meters of waste in 2002. Rocky also shipped more low level waste to the Nevada Test Site than in previous years, disposing of 32,174 cubic meters of waste.

- The site has shipped 5,200 of 12,500 cubic meters of transuranic waste (42% of total to be shipped); shipped 23,000 of 61,000 cubic meters of low level mixed waste (38%); and shipped 68,000 of 207,000 cubic meters of low level waste (33%).
- Workers have demolished 232 of nearly 800 structures on site.
- Four facilities—a uranium-contaminated building, a large administration facility, a large office facility and a calibration laboratory—were razed.
- Workers remediated eight of the top 10 highest risk environmental remediation sites.
- Remediation began on the site's largest soil removal project and the Solar Evaporation Ponds remediation was completed.
- Workers in Building 771—once dubbed "the most dangerous building in America"—removed the last of 240 gloveboxes in the facility in December 2002 reaching a key milestone for Rocky Flats. To date, workers have removed more than 850 of 1,324 highly-contaminated gloveboxes across the site.
- Full-scale deactivation and decommissioning activities are under way in all four of the former major nuclear buildings.

Because of innovations and the use of new technology, the total amount of waste expected to be generated throughout the closure project has been reduced. Using different chemical decontamination agents has reduced the amount of transuranic waste by thousands of cubic meters.

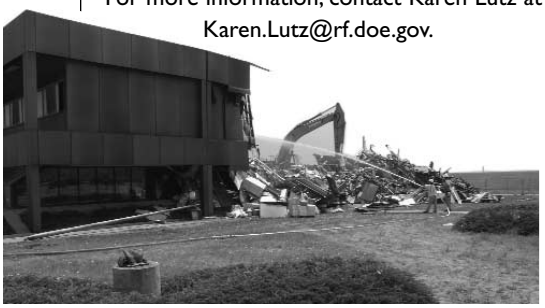
Ideas and processes were deployed that cut time and cost, and improved safety. Often the innovation was the result of simply recognizing the decommissioning potential of widely used products and processes: for example, using a spray-on coating of polyurea to package and ship large waste items and using water jets to cut up tanks. Water jet cutting systems have been used for several years in the automotive, aerospace and other industries.

Adapting this technology controls contamination, generates less waste and improves worker safety. The demonstration of using polyurea plastic resulted in nearly eliminating all safety and health hazards associated with size-reducing and packaging. Cost savings estimated for using this technology on two furnaces exceeded $30,000 and $100,000 on a large, contaminated waste compactor.

In many cases, the innovations not only moved Rocky Flats closer to safe closure, but drew keen interest from other Department of Energy sites.

The project met or exceeded all regulatory milestones for 2002 ahead of schedule under the Rocky Flats Cleanup Agreement (RFCA).

For more information, contact Karen Lutz at Karen.Lutz@rf.doe.gov.



Demolition was completed in June 2002 on Building 850, a former administrative facility.

Workforce Transition Accelerates at Rocky Flats

Site managers, local unions and stakeholders met at Rocky Flats in late March 2003 to discuss site closure, workforce transition and the new Department of Energy (DOE) Office of Legacy Management, which will have oversight of Rocky Flats when the site closes in 2006.

Michael Owen, incoming director of the Office of Legacy Management, committed $800,000 to fund the new Workforce Transition Program and the enhanced Career Transition Center (CTC) at Rocky Flats.

"Our office is responsible for softening the impact of downsizing at sites such as Rocky Flats," Owen said. "These funds are intended to help each worker prepare for their next job or career. The money will directly pay for many of the resources and services being offered through the enhanced CTC such as career counseling, resume development, entrepreneurial resource program and educational training programs."

"I am glad to see DOE Headquarters, the Rocky Flats Field Office and Kaiser-Hill [Rocky's prime contractor] jointly acknowledge the tremendous service the Rocky Flats workforce is doing for the community, Colorado and the country," said United Steelworkers of America Local 8031 president Tony DeMaiori. "We served on the front line of the Cold War and are now proudly and safely cleaning up Rocky Flats. Our workforce will be a great asset to many local businesses, and we need to help each worker successfully transition to their next stage in life."

"Our guardforce is likely the first group impacted by site closure. We appreciate any assistance these funds will provide our guards as our mission at Rocky Flats is diminished once the Special Nuclear Materials are safely removed from the site," said the president of the Rocky Flats Security Officers Independent Union Local 1, Dan Chesshir. "We have provided a valuable duty to the Rocky Flats Closure Project."

To date, more than 800 Rocky Flats employees have taken advantage of the Workforce Transition Orientation that provides a broad overview of the services and resources available through the CTC.

For more information, contact Karen Lutz at Karen.Lutz@rf.doe.gov.

Rocky Flats Security "Team of the Year"

The police officer team representing the Rocky Flats Closure Project was named the Department of Energy's (DOE) "Team of the Year" at the 30th annual Security Police Officer Training Competition.

Wackenhut Services placed first out of 12 teams representing DOE nuclear facilities. The team also competed against a team from the United Kingdom Atomic Energy Act Constabulary, military teams from the U.S. Marine Corps and the U.S. Air Force, three teams from the Office of Transportation Safeguards, and two law enforcement teams.

"Our Security Police Officer team has proven itself to be the best of the best," said Marvin Brailsford, Kaiser-Hill vice president for Material Stewardship. "The

Rocky Flats Security, *continued on page 7*

Enhanced Monitoring Wells at Fernald Aid Aquifer Cleanup

Ground water scientists at the Department of Energy's Fernald Environmental Management Project are using multilevel monitoring wells to assist in tracking the remediation of a 170-acre uranium contamination plume in the Great Miami Aquifer, which covers approximately 960,000 acres. The aquifer underlies the Fernald site and is one of the largest sole source aquifers in the nation.

The multilevel wells have lower installation costs than standard wells and provide data from a large cross-section of the plume so scientists can more closely monitor the performance of Fernald's ground water restoration program.

Multilevel monitoring wells allow scientists to monitor up to six different depth intervals per well and spot sample the bottoms of the wells. For large contamination plumes like Fernald's, which measures 40 to 50 feet deep in places, multilevel wells provide data from across the entire plume. With this additional

A cross section of a multilevel well shows how Fernald scientists take multiple samples at different depth intervals. Scientists are using the additional data to track the restoration of the underlying aquifer.

Enhanced Monitoring Wells, *continued on page 13*

Industrial Sites Project Saves Time and Money… and Reduces Risk

Thanks to teamwork and innovative approaches to getting the job done, the Industrial Sites Project at the Department of Energy's (DOE) Nevada Test Site (NTS) has seen remarkable progress in past months. In the past fiscal year alone, all project milestones were met, and 19 assessments, four remediations and eight site characterizations were completed. Here are just a few examples of industrial sites achievements in Nevada:

Better, Cheaper, Faster...

The Industrial Sites Project is a big customer of new, innovative technologies. Recently, the project team employed the In-situ Object Counting System (ISOC) as part of the closure activities at the Reactor Maintenance, Assembly, and Disassembly facility. Typically, removing radioactive material from inside a building would have required the team to first collect the material and then package it for shipment to a laboratory for further analysis and characterization. However, by using the ISOC system, collected samples could be analyzed and characterized at the site, which provided real-time data and saved approximately 450 man-hours in labor costs.

At another corrective action site, a technique known as X-Ray Fluorescence (XRF) helped reduce the volume of hazardous waste by 95%. Similar to an ultraviolet lamp, the XRF can make objects glow (fluoresce) and project different colors. The specific color emitted determines what elements are present and the intensity indicates just how much of an element is present. One of the contaminants of concern at this site was lead. Using the XRF unit on samples, scientists were able to obtain information pertaining to the amount of lead within 30 seconds. Using this technique, it was determined that only two of the 40 cubic yards of waste material needed to be disposed of as hazardous waste.

The Industrial Sites Project conducts investigations and corrective actions at sites that have been potentially impacted as a result of past nuclear testing and support activities at the Nevada Test Site (NTS) and the Tonopah Test Range (TTR). The contaminants of concern at sites located at the NTS and TTR include various organic and inorganic compounds, metals, unexploded ordnance, and various radionuclides.

Positive Partnership with U.S. Air Force Saves DOE Time and Money...

The Industrial Sites Project was tasked with removing debris from a disposal area at the Tonopah Test Range (TTR), located northwest of the Nevada Test Site on the Nevada Test and Training Range (formerly the Nellis Air Force Range). A total of 2,780 cubic yards of debris was excavated from the area, and through a cooperative effort between the DOE's Nevada Site Office and the U.S. Air Force, the debris was disposed in the U.S. Air Force's landfill at the TTR. This debris would normally have been hauled off the test range and transported back to the NTS, more than three hours away. This effort shortened the project schedule by 62 days and saved nearly $580,000.

"The Air Force views this land (TTR) as a national treasure, with a lot of testing and training taking place here," said Lt. Col. Richard Scarine. "This all entails cooperation between the DOE and the Department of Defense, and I definitely think that's happening."

Preliminary Assessment Finds More Than 250 Mud Pits...

The Preliminary Assessments (PA) team, a group within the Industrial Sites Project, is charged with investigating sites before any field work begins. Historical data are carefully analyzed and interpreted to determine the potential for residual contamination.

All 828 underground nuclear tests that were conducted at the Nevada Test Site used drilling methods that required drilling lubricants (mud), which were contained in excavated areas near the tests known as mud pits. Over time, some of the mud pits blended in with the surrounding environment. To locate these mud pits and assess any potential release of contaminants, the PA group reviewed more than 10,000 photographs of mudpits associated with almost 3,700 drill holes. Recently, the team completed the mammoth task of identifying 257 mud pits, verifying current conditions at every mud pit site, and then preparing an inventory report detailing their findings. The completion of the PA team's reports laid the groundwork for the Industrial Sites Project to continue its efforts to group the mud pits by similarities and to develop a strategy for characterization.

For more information, visit the Nevada Site Office's Environmental Management Web site at: http://www.nv.doe.gov/programs/envmgmt/default.htm.

INEEL's Alternative Technology

How do you treat one million gallons of liquid radioactive waste in the safest and most efficient manner possible? Over the next several months, the Department of Energy (DOE) will work closely with the Idaho National Engineering and Environmental Laboratory (INEEL), the State of Idaho, stakeholders and the general public to select a technology to treat sodium-bearing waste stored at the Idaho Nuclear Technology and Engineering Center's tank farm.

Over the past 50 years, the tank farm has safely stored liquid high-level waste (generated from spent nuclear fuel reprocessing efforts) and sodium-bearing waste (resulting from cleaning contaminated facilities and equipment). To date, all of the liquid high-level waste has been removed from the tank farm and solidified through calcining campaigns. Removing the sodium-bearing waste from above the Snake River Plain Aquifer and converting it into a stable and solid form remains one of the DOE's highest priorities.

An aerial view of the tank farm, which includes eleven 300,000-gallon underground stainless steel tanks.

"During 2003, we will be working closely with the DOE and its stakeholders to identify a technology alternative to treat the sodium-bearing waste that is currently stored in the tank farm," said Gary Milnarich, project manager for sodium-bearing waste treatment for the Idaho Completion Project. "Additionally, DOE is seeking public input and has scheduled several workshops throughout the year to provide citizens with a forum to learn more about the technology options and to provide comments about the selection process. The information gained from stakeholders will then be considered by DOE as they make the final technology selection."

The DOE has narrowed its selection to four alternatives: calcination with a Maximum Achievable Control Technology (MACT) upgrade, steam reforming, direct evaporation and cesium ion exchange. Each of the treatment technologies has its own advantages for processing the waste as efficiently and economically as possible so that it can eventually be removed from Idaho. A definition and brief summary of each technology option currently under consideration is provided below.

Calcination with MACT Upgrade
A process to convert sodium-bearing waste into granular solid form uses a drying process. Air is used to mix, or fluidize, the waste and additives. Combustion of kerosene creates the heat to dry the waste and additives to form calcine. This is a high-temperature (600 degrees Celsius) thermal process.

Steam Reforming
A similar process to calcination, steam reforming uses a fluidized bed drying process to produce a granular solid. Steam reacts with the waste and additives to dry the mixture. The heat source is electric heaters, thus eliminating the need for an external fuel source. This is a high-temperature (600 to 750 degrees Celsius) thermal process.

Direct Evaporation
The volume and mass of the liquid sodium-bearing waste is reduced through evaporation. The waste is then solidified by cooling the supersaturated solution. This is a low-temperature (90 to 120 degrees Celsius) thermal process.

Cesium Ion Exchange
Solids are filtered out of the sodium-bearing waste and cesium is removed through a process called "ion exchange." The remaining liquid waste can then be mixed with chemicals, a process called "grouting," or absorbed onto a silica-based material for disposal. This is a non-thermal process that operates at room temperature.

The DOE's strategy in selecting a treatment alternative is to seek public input and complete conceptual designs for each of the technology options. The public comments and conceptual design reports will then be analyzed and considered before a final technology selection is made.

"Public involvement will play a critical role in making the final decision to select a treatment technology for the liquid sodium-bearing waste," said Milnarich. "Our goal is to involve the public as early as possible in the decision-making process to provide adequate time to discuss issues. We anticipate a large response from citizens throughout the state."

For more information, contact Bruce Byram at byrabj@inel.gov or (208) 526-3127.

***Rocky Flats Security,** continued from page 5*

Rocky Flats protective force is made up of highly trained and skilled professionals and this team is an accurate representation of our entire protective force."

The training competition consists of an individual and a team competition, which includes five events testing the competitors' skills in combat shooting, physical fitness, and tactical obstacle courses. Team events test a team's ability to respond to a situation effectively and efficiently, with cohesiveness, decisiveness and physical endurance playing a major role.

For more information, contact Karen Lutz at Karen.Lutz@rf.doe.gov.

Idaho-Ohio Team Gets "Real-Time" Results

The Idaho National Engineering and Environmental Laboratory (INEEL) and the Fernald Environmental Management Project have developed a system to rapidly scan, characterize and analyze surface soil contamination on location, which has already saved millions of dollars by eliminating hand collected samples.

The system consists of a sodium iodide spectrometer and global positioning system (GPS) hardware, which can be mounted and used on four different platforms. These platforms consist of an all-wheel drive utility vehicle, hand-pushed units and an excavation-mounted system. Additional applications can include backpack systems and others.

The mobile spectrometer concept was initially developed and used by Fernald engineers to prescreen and analyze soils contaminated with uranium, thorium and radium. This analytical system generated an estimate of field coverage and activity levels after several days of data processing and analysis.

To streamline the data acquisition and analysis process, INEEL integrated engineering and computer hardware and software to provide real-time activity and coverage maps to technicians performing work in the field. Online analyses have been added to automatically examine and correct collected spectra for energy calibration drifts, and strip spectra in regions of interest to provide moisture-corrected activity levels for total uranium, thorium-232 and radium-226. The software also provides checks and alarms to alert operators when hand examination of spectral data may be necessary.

Fernald managers estimate that use of this technology has already saved more than $16 million, and may save up to $34 million through fiscal year 2006.

INEEL has applied this real-time concept to develop an in situ platform—the Actinide X-Ray Scanning System (AXISS)—to detect concentrations of Plutonium-238 in contaminated soils. The heart of this system is a large area proportional counter that collects spectra in the x-ray energy region. A prototype of this system was successfully demonstrated in October 2002 at the Mound Closure Project in Ohio. Final testing of the AXISS will performed in May 2003.

For more information, contact Doug Maynor at (937) 865-3986.

Columbia River Shoreline Gets Cleaner

In early 2003, Hanford's Spent Nuclear Fuel (SNF) Project passed a critical juncture when it finished moving more than two million pounds (more than 1000 metric tons) of highly radioactive spent nuclear fuel out of the K Basins along the Columbia River. The achievement represents about 26 million curies of radioactivity moved away from the river shoreline. Moving all this fuel is one of the most significant risk reduction activities at the Hanford site in the last 60 years.

"Our critics said we'd be months or even years behind schedule, but we knew we had to stay the course and let our performance prove them wrong," said Department of Energy (DOE) Richland Operations Office Manager Keith Klein. "Getting to this point has taken dedication, innovation, and coordination of numerous individuals at all levels of the contractor and Federal work forces."

To accomplish this feat, the SNF employees started up the fuel transfer system to move the K East Basin's more degraded fuel to the K West Basin. On November 25, 2002, the system delivered its first load—ten canisters—of irradiated uranium fuel to the annex building adjacent to the K West Basin, where it will be stored in a long-term, dry, underground vault away from the river.

This milestone brings the SNF Project to about its halfway point of removing all the spent fuel from both basins. The remaining spent nuclear fuel will be removed by May 31, 2004.

For more information, contact Andrea Powell at (509) 376-0626 or Andrea_S_Powell@rl.gov.

An operator at the Fuel Transfer System console works in the Fuel Transfer annex. Shown at right is the straddle carrier on the rails that run from the basin to the annex.

Fernald Rail Operation on Track for 2004 Completion

Fernald's train crew assembles 61 gondola railcars to make the 75th unit train to leave the site loaded with waste pit material. On average, each unit train carries 6,000 tons of waste.

The most extensive rail operation in the Department of Energy (DOE) complex is enabling the Fernald site in Ohio to accelerate remediation and disposition of a 37-acre waste pit area that once contained over one million tons of low-level radioactive waste. Fernald is fewer than two years from completing the remediation.

In March 2003, Fernald workers shipped the 79th train of material to Envirocare, a licensed commercial disposal facility near Clive, Utah, as part of DOE's long-term cleanup plan for the Waste Pits Project, one of five remediation projects at the site.

The waste pit area contains six waste pits (which range in size from one to five acres and vary in depth from 10 to 40 feet), a burn pit and clear well. During past uranium production operations, Fernald disposed of solid and liquid processing material and refining residues in the waste pits and incinerated materials, such as laboratory chemicals and refining residues, in the burn pit. The clear-well served as a settling basin for processing water.

Prior to initiating full-scale remediation of the waste pits, Fernald constructed an 11-track rail yard and procured 170 gondola railcars and three locomotives. Since the first train left the site in April 1999, Fernald has maintained a steady shipping cycle of one train every two to three weeks. As the waste is excavated, cleanup workers haul it by truck to onsite remediation facilities where they process and treat the waste to remove excess moisture, load it into double-lined railcars with secure lids, and assemble the cars into a unit train for shipment to Envirocare. Over a five-year shipping period, Fernald estimates it will transport 124 trains of waste to Envirocare. Each train consists of about 60 railcars and carries approximately 6,000 tons of waste.

As it nears its fourth year of operation, Fernald has shipped more than 500,000 tons, an equivalent of 25,003 truckloads, of an estimated 790,000 tons of processed waste to Envirocare and is on schedule to complete waste processing operations by the end of 2004.

"By excavating the waste pits, we are eliminating yet another source of ground water contamination to the underlying aquifer," said Dave Lojek, DOE Waste Pits project manager. "Every train that leaves our gates and arrives safely at the disposal facility brings us one step closer to completing this project."

For more information on the Waste Pits Project, contact Dave Lojek at (513) 648-3127 or dave.lojek@fernald.gov.

Fernald's New Technology Reduces Radon

After rigorous operability testing, the Department of Energy's (DOE) Fernald site tested a new radon control system in December 2002 that reduced the concentration of radon gas in two concrete waste storage silos by 95 percent. This is the first step in the removal of the silos' waste which is scheduled to be completed in May 2006.

Known as the K-65 Silos, the aging structures were constructed in the 1950s and contain 8,900 cubic yards of low-level, radium-bearing waste. "The new system reduces radiation exposure levels so workers can safely remove the waste from the silos in preparation for treatment and disposal," said DOE Silos Project Manager Nina Akgunduz.

The Radon Control System (RCS) stands about 40 yards from the earthen-bermed silos. Fans within the RCS draw the radon-bearing air into the facility via a series of valves and piping connected to manways (like manholes) on top of the silos. The radon gas is removed by passing the air through filters containing activated carbon. Once the air has traveled through the carbon beds it passes through HEPA filters to remove any remaining particulate from the radon decay chain.

The next step in remediating Fernald's silos will begin in June 2003 when Fernald cleanup crews will initiate installation of waste retrieval equipment around the silos. Using water jets and slurry pumps, the crew will remove the clay-like waste from the silos and transfer it to four 750,000-gallon temporary storage tanks. Treatment plant operators will then blend the waste with cement to produce loose concrete suitable for safe packaging and offsite transportation.

For more information, contact Nina Akgunduz at (513) 648-3110 or nina.akgunduz@fernald.gov.

Cocooning Complete at DR Reactor

"If people want to see visible cleanup progress at Hanford, the first place they should go is to one of the old reactor sites," said Rep. Doc Hastings (R-Wash.) at a November 2002 ceremony marking completion of cocooning of DR Reactor. It is the second of Hanford's nine plutonium reactors to be cocooned and was completed nearly a year ahead of schedule.

There are four parts to decommissioning and dismantling a reactor: engineering, pre-demolition, demolition, and the safe secure enclosure (cocooning) phases.

Cocooing is the common way of referring to the Interim Safe Storage (ISS) project. Cocooning is conceived to give the highly radioactive reactor cores time to decay to relatively manageable levels.

It is the process of placing Hanford's old reactors in interim storage for up to 75 years. It involves removing all reactor buildings and support structures except for the five-foot-thick concrete shield walls surrounding the reactor core. This is known as cocooning because all doors and other openings in the remaining structure are sealed and a new roof is added to the structure, sealing it off from the world.

DR Reactor was a Cold War-era facility operated 1950-64. "We've been dismantling and cocooning DR Reactor since July 1998," said Mike Mihalic, project manager for Bechtel Hanford Inc, Hanford's Environmental Restoration Contractor. "With C Reactor completed in 1998, DR in September and three additional reactors underway, we've developed quite an efficient team. They know what they're doing and they do it safely. We're very proud of what our team has accomplished."

Placing a 75-year roof over the remaining portions of the DR Reactor building is the last step in the cocooning process.

"We've learned a great deal since we began work on C Reactor in 1995," Mihalic added. "It cost about $27 million to cocoon C Reactor." But the DR Reactor cocooning costs were only approximately $17 million. "Because of the efficiencies we've developed, we've been able to reduce the costs to the point that we can cocoon four for the price of three," Mihalic declared.

Sometime in the next 75 years, the Department of Energy (DOE) and the regulators will decide when to implement the disposal part of the effort. The current plan is to transport the graphite reactor cores to Hanford's central plateau on giant crawlers, similar to those used to transport the space shuttle to the launch pad. The cores, 40-foot cubes that weigh between 11,000 and 16,000 tons, would be buried in a common trench under an engineered barrier.

According to the Tri-Party Agreement between DOE, the Environmental Protection Agency and the State of Washington, the surplus reactors originally were not scheduled to be cocooned for several more years. As part of DOE's effort to reduce risk and accelerate cleanup, the milestones were renegotiated in 2002. Even with the renegotiated milestones, all work on DR was completed well ahead of the September 2003 milestone and cocooning of the other reactors will be accelerated as well.

"Hanford has made significant progress cleaning up the old reactors and associated cooling water effluent sites," said Bechtel Hanford President Mike Hughes. "That work represents significant progress toward DOE's goal of accelerated cleanup of the Columbia River corridor."

Hughes added that he is most pleased with the team's safety record. Nobody has lost a day of work to injury since the ISS project started seven years ago. "This is heavy duty demolition work where the risk of accident can be high without the proper focus on safety," he said.

When complete, one or more doors will be left intact, but welded shut. Sensors will be used to remotely monitor temperature and moisture in the building. Once every five years, surveillance and maintenance staff will unseal the door and enter the facility to conduct a visual inspection.

For more information, contact Andrea Powell at (509) 376-0626 or Andrea_S_Powell@rl.gov.

New Fernald Stewardship Web Site

The Fernald Closure Project has launched a new Web site describing the site's plans for post-closure surveillance and maintenance of the On-Site Disposal Facility and restored areas of the Fernald site.

Since the late 1990s, the Department of Energy (DOE) and Fluor Fernald have been working with stakeholders to prepare for the site's transition to long-term stewardship after site remediation is complete in late 2006. The Web site, http://www.fernald.gov/Future/Future.htm, includes Fernald's Comprehensive Stewardship Plan and information about records management requirements, funding, and the Department's stewardship policies and guidance documents. Information is also available on Fernald's final land use/public use plans and cleanup progress.

For more information, contact Gary Stegner at (513) 648-3153 or gary.stegner@fernald.gov.

New Technology Helps Prioritize Hanford Cleanup

Cleanup of the more than 700 waste sites at the Hanford site in Washington will be addressed by a comprehensive new tool that will predict the movement and fate of contaminants through ground water, the vadose zone (the soil above the ground water) and the Columbia River. The System Assessment Capability (SAC) is an integrated system of computer models and databases that also assesses the impact of contaminants on human health and the environment.

Instead of showing each waste site in isolation as has been done in the past, SAC shows each waste site in context. "It looks at all the waste sites at Hanford in relation to each other and how they contribute to future impact," said Bob Bryce, SAC project manager for Pacific Northwest National Laboratory, which developed the tool for Hanford. "Using SAC, we can see which waste sites are making the greatest impact and clean them up first."

Two sets of computer models are at the heart of SAC. The first set—the environmental model—simulates how contaminants move through the environment. The second set estimates risk and impact from those contaminants.

The environmental model is based on a comprehensive inventory of potential contaminants from Hanford operations as far back as 1944. With information about the quantity and concentration of contaminants at a site, SAC determines how the contaminant will behave, how the contaminant will discharge to the soil and move to the ground water, and how it will discharge into the ground water and enter the Columbia River.

The second computer model set estimates risk and impact based on a contaminant's persistence in the environment, its mobility, chemical form and toxicity and where it appears in the accessible environment.

"A lot of mobility is determined by the nature of the contaminant and the soil," Bryce added. "Some contaminants, such as plutonium, may bind up chemically in the soil and not be a significant risk through the ground water pathway. Other contaminants, such as technetium, are mobile and have long half-lives."

Various scenarios are developed and modeled to evaluate alternative cleanup strategies. These scenarios are based on the chemical inventory, geology, chemistry and the hydrology of the site. The consequences of these scenarios on the environment and the impact of various cleanup options are predicted.

Scientists have tested the validity of SAC by comparing results to known plume migrations at the Hanford Site over time. The model currently provides a useful, but not perfect representation of historical plume migrations. Refinements are underway and researchers are preparing to conduct a composite analysis of the future impacts of waste left at Hanford. The results of this study will be considered as future waste disposal decisions are made at the site. SAC is an integral part of the Department of Energy's Ground Water Protection Project at Hanford.

For more information, contact Kathryn Lang at Kathryn.Lang@pnl.gov.

Protecting the Columbia River Corridor is a major focus of Hanford Site cleanup activities.

Demolition of Accelerator Facility Hastens Cleanup

For the Oak Ridge Environmental Management Program, simply learning how to spell "EN Tandem Van de Graaff Accelerator" facility was the first of many difficult challenges in this successful disassembly and removal project. The Oak Ridge National Laboratory (ORNL) used the accelerator for nuclear physics research from the early 1960s until it was decommissioned in the late 1990s.

More than 325,000 pounds of equipment were disassembled, loaded, and shipped from the building in just over two months with no injuries. The success of the project was largely due to the innovation and active input of the labor force. ORNL arranged to send many of the retired accelerator components to a lab at the University of Mexico, which operates a similar system.

The 40-foot-long accelerator vessel, weighing 90,000 pounds, is being moved out of a building at Oak Ridge National Laboratory.

For more information, contact Sherry Moon at (865) 576-0109.

4 Million Ton Milestone at Hanford

In January 2003, the four-millionth ton of contaminated waste – enough to fill the Empire State Building 1.5 times – was placed in Hanford's Environmental Restoration Disposal Facility (ERDF), the result of nearly six years of continuous operation.

"ERDF is key to cleaning up the Hanford Site in a safe, cost-effective manner and to protecting the Columbia River," said Owen Robertson, who oversees ERDF work for the Department of Energy's (DOE) Richland Operations Office. "Four million tons of contaminated waste have now been safely and efficiently disposed, protecting people and the environment."

The massive disposal facility for Hanford's low-level and hazardous waste is located in the center of the 586-square-mile Hanford Site. Each day, workers at ERDF typically empty an average of 145 containers filled with low-level and hazardous waste, rock, soil and other debris, mostly from former production reactor sites along the Columbia River.

"In addition, demolition and cocooning debris from Hanford's old production reactors and wastes from other Hanford facilities are filling the facility," said Jeff James, ERDF site supervisor for Bechtel Hanford, the contractor that manages the project.

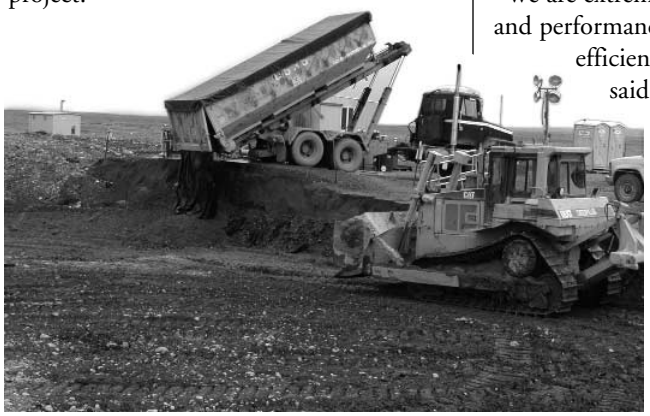
Once the waste is collected, it is placed into "cans" that hold up to 20 tons. Drivers haul the cans from the dig sites to nearby staging areas. From there, other drivers haul the cans over Hanford Site roads to the ERDF container transfer area.

The cans are then taken into the disposal facility, unloaded and emptied, and delivered back to the ERDF container transfer area. The cans then go back to the dig sites, or wherever they are needed, and the process begins again.

ERDF itself comprises four enormous areas, or "cells." Each cell is constructed with a bottom liner consisting of double layers of impermeable materials, such as flexible plastic membranes and clay admix and a system above the impermeable layer to catch liquids as they drain from waste materials.

With an estimated 10 million tons of waste along the Columbia River corridor, DOE and the Environmental Protection Agency have proposed adding four more cells to ERDF, doubling its capacity. Design for cells five and six were completed in March 2003, with construction to begin in late 2003. The cells are expected to be ready to receive waste by 2005.

"We are extremely proud of the design and performance of ERDF and of the efficiency of the team," Robertson said. "And, the team's dedication to safety – zero lost-day accidents since operations started in 1996 – while working under an aggressive schedule is an extraordinary accomplishment."



What was once a very large hole in the ground is nearing its operational capacity of 5.2 million tons. More than four million tons of contaminated soil and debris fill the four existing cells at the Environmental Restoration Disposal Facility.

For more information, contact Andrea Powell at (509) 376-0626 or Andrea_S_Powell@rl.gov.

Oak Ridge Facility "Less Hazardous"

A nuclear facility at Oak Ridge has been re-categorized as a less hazardous "Radiological Facility" thanks to the removal of a radium boron source.

Built in 1951, the Bulk Shielding Reactor was previously used for isotope production, radiation shielding measurements, material irradiation, and material experimentation. The facility houses a pool that was used for the reactor and at one time contained 73 irradiated fuel elements and three radioactive sealed sources.

The Environmental Management Program in Oak Ridge removed the final radium boron source in February, allowing the facility to receive its new categorization.

The source material was moved quickly, with workers pulling the canister out of the pool with long-handled tools and sealing it in a drum. The drum was then loaded into a separate cask.

Safety was always the key consideration on this project. Several practice sessions as well as an extensive briefing were held before the work was performed. Using already established integrated safety measures as well as abiding by "As Low As Reasonably Achievable" principles which allow 200-300 millirem dosages, the dose to workers was held significantly below estimates at a mere 11 mrem. Large-area wipes were used in the removal area to detect any contamination, and none was found.

The radium boron is currently being stored in a waste management storage facility. It may be offered to other sites that can use it in science experiments.

For more information, contact Sherry Moon at (865) 576-0109.

Delivering On Commitments

ORP Meets Challenges Head On

The Department of Energy's (DOE) Office of River Protection (ORP), through its management of the River Protection Project, is working to meet the challenge to clean up Hanford's tanks. The plans call for safely removing the waste from the tanks, treating the waste, safely storing or disposing of the treated waste, and ultimately closing the tanks. During 2002, ORP transformed its plans into accomplishments.

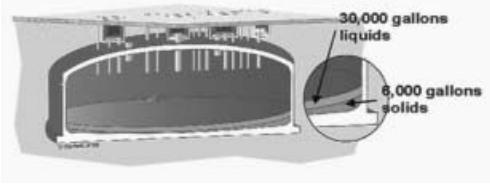
Construction started on the Waste Treatment Plant, the largest radiochemical processing facility in the world, which will vitrify Hanford's tank waste beginning in 2011. Concrete and rebar now form the visible skeletons of the Waste Treatment Plant's major processing facilities.

Construction was completed on the Hanford Cold Test Facility, an 800,000-gallon mock tank allowing for the testing of technologies in an environment that reduces the risk of worker exposure to radiological and chemical hazards.

Miles of additional waste transfer piping were installed to the waste feed delivery system that will enable tank-to-tank transfers and connect the double-shell tanks storage area with the Waste Treatment Plant.

Notable progress was made on removing liquid waste from Hanford's single-shell tanks as more than 2.5 million gallons of waste were pumped and transferred to double-shell tanks for safer storage.

ORP also worked with Bechtel National, Inc., its prime contractor for the design and construction of the Waste Treatment Plant, to optimize the melter configuration for vitrifying high-level waste and low activity waste to ensure that waste will be treated faster and more efficiently.



The first Hanford tank selected for waste retrieval and closure, single-shell Tank C-106, contains approximately 30,000 gallons of liquid waste and approximately 6,000 gallons of sludge-like waste. It is expected that retrieval operations to remove waste from the tank will begin in 2003.

In addition, in October 2002, ORP announced new and aggressive performance incentives with its prime tank farm contractor, CH2M HILL. The performance incentives aim to accelerate tank cleanup and focus on liquid tank waste removal, completion of the waste feed delivery system, tank closure, and the use of supplemental technologies to augment the capacity of the Waste Treatment Plant to treat low activity tank waste.

Although changes in plans for a project as large and complex as tank cleanup at Hanford are inevitable, the commitment of ORP to complete tank cleanup, and to do it in a manner that protects the safety of workers and the environment, will not change. Delivering on safety commitments through the practice of safe operations is the top priority for the project.

For more information, contact Erik Olds at Theodore_E_Erik_Olds@rl.gov.

Tank Cleanup at a Glance

- The cleanup of tank wastes at the Hanford Site is one of the nation's largest and most complex environmental challenges.
- Fifty-three million gallons or sixty percent of the volume of DOE nuclear waste is stored in Hanford's 177 aging underground tanks.
- Sixty-seven of these tanks are suspected to have leaked more than one million gallons of waste into the ground.
- The DOE is continuously monitoring the tanks for potential leaks in order to protect the environment from any further damage.

Enhanced Monitoring Wells, *continued from page 5*

knowledge, scientists can determine appropriate extraction well pump rates.

Previously, Fernald scientists used repetitive direct push sampling, a process in which technicians "push" a sample rod into the ground to a desired depth, and multiple standard monitoring wells to monitor the portions of the plume that are thicker than 15 feet. Although both are proven ground water monitoring techniques, they are less effective with larger, thicker contamination plumes. Direct push sampling can provide sampling at discrete levels in the aquifer, but it requires a significant effort and cost outlay to resample at the same location, limiting the sample frequency. Six monitoring wells would be required to provide the six depth intervals obtained from one multilevel well.

"After more than a year of testing, multilevel wells have proven to be effective tools in tracking the cleanup of the aquifer," said Rob Janke, DOE-Fernald project manager.

For more information, contact Rob Janke at (513) 648-3124, or rob.janke@fernald.gov.

D&D of Gaseous Diffusion Buildings in Oak Ridge

Oak Ridge is moving toward completion of one of the largest environmental cleanup projects in the world: decontamination and decommissioning (D&D) of three massive gaseous diffusion plant buildings. The project is part of a reindustrialization effort by the Department of Energy at the old K-25 site, now known as the East Tennessee Technology Park.

D&D within the process facilities involves more than 328 million pounds of material to be dismantled and disposed of in an environmentally responsible manner. The combined buildings measure more than 4.8 million square feet of space.

Inside the three buildings are the major components (converters, compressors and motors) that were the workhorses in the facilities' uranium enrichment process.

- In building K-33, all 632 of the 36-ton converters have been removed, as have the 611 compressors and 640 motors.
- In K-31, only 160 of the 595 converters and 200 of the 606 compressors remain to be dismantled. Removal in K-31 is 43 percent complete.
- In K-29, the disassembly of additional converters and compressors will begin in April.

With overall project removal at 73% completion, the current schedule calls for the dismantlement of 17 converters and 15 compressors a week. Officials for BNFL, Inc., the contractor handling the D&D, report that the project is on schedule for mid-2004 completion.

For more information, contact Jack Howard at (865) 576-5982.

K-33 Cell Floor – After D&D

Year-Long 60th Birthday Celebration

More than 50 1940s-era employees of the former K-25 Gaseous Diffusion Plant in Oak Ridge, TN, were recently treated to lunch and a site tour by the Department of Energy and Bechtel Jacobs Company as part of the site's year-long 60th Anniversary Celebration. Several of the retirees who were part of the Manhattan Project spoke to the group about their experiences at K-25 during the war. The K-25 site, now called the East Tennessee Technology Park, is scheduled for closure in 2008. Many of the historic buildings, including the massive (1.6 million square feet) K-25 building, the nation's first facility built to enrich uranium using gaseous diffusion, are scheduled for demolition. The luncheon and tour was the first of several 60th Anniversary events planned throughout the year.

Jessie Roberson Visits Oak Ridge

Jessie Roberson, Assistant Secretary for Environmental Management, is pictured with Gerald Boyd, Oak Ridge Operations Manager, during a recent visit to Oak Ridge, Tennessee. Roberson visited the site to meet with community leaders and discuss DOE's fiscal year 2004 budget request to Congress. She also announced that DOE will take steps to transform the site's cleanup contract with Bechtel Jacobs Company, LLC, to a closure contract. Changing the contract arrangement will accelerate cleanup work by five years, saving $1 billion and cutting nine years from the original cleanup schedule.

Things Are Heating up in Paducah

Researchers at the Paducah Gaseous Diffusion Plant in Kentucky are currently testing a ground water remediation technology that uses electrical resistance heating at greater depths, and in faster ground water flows, than ever before.

The project, called the Six-Phase Heating Treatability Study, uses seven electrodes – six positive and one negative - to generate heat 100 feet below ground. The heat generated vaporizes volatile contaminants, creates steam from moisture and dries the soil. The resulting steam and vaporized tri-chloroethylene (TCE) is then drawn by vacuum through activated carbon filters, which capture the vaporized TCE. Clean water is stripped off, and the emissions are closely monitored to assure that releases to the environment stay at safe levels.

The Paducah plant is the only operating uranium enrichment plant in the nation. The Chemical Cleaning Building is an essential part of plant operations, so any remediation approach must leave the building undisturbed. Monitoring at the plant indicates that there is a large quantity of TCE below the Chemical Cleaning Building, near the center of the facility. This area is considered the dominant source of ground water contamination, which has spread in a two-mile wide plume well beyond DOE property.

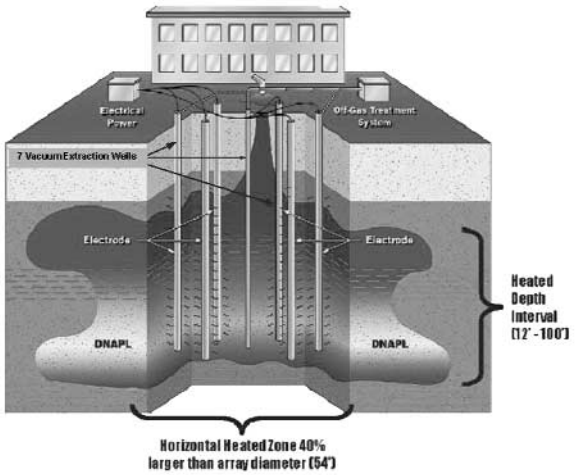
At Paducah, the source is deeper than usual. TCE is sitting like molasses on the lower levels of the Regional Ground water Aquifer, about 100 feet below the surface. Making removal even more difficult, ground water at the plant moves about a foot per day.

There may be 180,000 gallons of TCE in the main source at the Paducah plant. Concentrations in ground water at the study site exceed 100,000 micrograms per liter, vastly exceeding regulatory standards. Project managers hope the test will demonstrate that more than 90 percent of the TCE can be removed with the electrical resistance heating technology.

Electrical resistance heating has already been used successfully to remove volatile and semi-volatile organic compounds from contaminated soils with minimal surface disruption.

If tests are successful, Paducah plans to deploy several more electrical resistance heating arrays in the same area of the plant.

For more information, contact Gary Bodenstein at (270) 441-6831.



The study will test the effectiveness of electrical resistance heating for the remediation of a 100-foot deep TCE ground water contamination source at Paducah. Electrodes in a hexagonal array will heat the soil, vaporizing ground water and TCE. Vacuum wells will extract the vapors, which will be pulled through activated charcoal filters before release to the atmosphere.

Portsmouth Improves Safety Statistics

Employees at the Portsmouth Gaseous Diffusion Plant dramatically improved their safety record for fiscal year 2002 by reducing their recordable injury/illness incidence rate to 1.44 per 200,000 hours worked, down from 7.23 in 2001.

"This is the result of a concentrated effort to ensure that safety is the number one priority in everything we do," said Gil Drexel, Portsmouth Manager of Projects for Bechtel Jacobs Company. "A safe workplace is the result of the efforts of every employee, every single day," Drexel said. He pointed out a number of changes made in 2002 to make the Portsmouth site safer. "First we had to believe we could achieve zero accidents, then we implemented a plan to reach that goal."

The plan includes daily morning meetings with line-level managers and subcontractors to discuss projects and safety concerns, and a seven-member Incident Review Board (Board) that was created to evaluate events that either resulted, or had the potential of resulting, in a work-related injury. Members on the Board with the most knowledge of the conditions analyze each incident and the best way to prevent recurrence is determined.

Improving on the 2002 safety record is now the challenge for the 500 Bechtel Jacobs employees and subcontractors who make up the Portsmouth workforce.

For more information, contact Tony Takacs at (740) 897-2123.

Cleanup Milestone at LANL

Cleanup at Material Disposal Area P (MDA P) has been completed at the Los Alamos National Laboratory (LANL), a significant milestone in the pursuit to clean up the Material Disposal Areas.

MDA P is located on the south rim of Cañon de Valle on the western edge of LANL. The landfill began receiving waste from Burning Grounds in 1950, as well as debris from World War II era buildings. Operation of the landfill was suspended in 1984. Personnel began the closure process in 1997.

During cleanup, the discovery of high explosives required the use of a remote excavator to remove material from the site. Approximately 52,500 cubic yards (3,000 truck loads) of soil and debris material were excavated, one of the largest excavations by remote equipment in the Department of Energy complex. Remote excavation of the landfill began in February 1999 and was completed on May 3, 2000, just before the Cerro Grande Fire, which consumed 48,000 acres. Excavation of contaminated soil beneath the landfill using non-remote excavation methods resumed after fire recovery and was completed in March 2001. Phase II confirmatory sampling and geophysics measurements began in June 2001, at which time additional contamination was found. The contaminated material was excavated and shipped offsite. Waste removal was completed at MDA-P in February 2002.

The New Mexico Environment Department's Hazardous Waste Bureau received the "Material Disposal Area - P (MDA-P) Area Closure Certification Report" on January 31, 2003. The three-volume report includes clean closure certifications for the TA-16 MDA-P landfill, the 387 Flash Pad, and a Voluntary Corrective Action Report for Solid Waste Management Unit 16-016(c)-99. Meeting this regulatory deliverable also met the requirements of an Appendix F Performance Measure. Removing or decontaminating a site and showing that levels of hazardous contaminants do not exceed EPA-recommended exposure levels accomplishes clean closure. Baseline data from this project will be used to evaluate corrective actions at other Laboratory Material Disposal Areas.

For more information, contact Saundra Martinez at saundra@lanl.gov.

Cleanup at Material Disposal Area P is complete at the Los Alamos National Laboratory.

Permeable Barrier Captures Pollution

Researchers at Los Alamos National Laboratory (LANL) recently installed a "pollution trap" to capture chemicals and radionuclides and prevent the contaminants from migrating downstream.

Water flowing downstream of LANL now will flow through a Permeable Reactive Barrier — a huge column of pollution-capturing materials — before proceeding farther downstream. Water that encounters the barrier will be scrubbed of radionuclides such as strontium-90, americium-241, plutonium 238, 239 and 240, and uranium isotopes as well as chemicals such as perchlorate, nitrate and heavy metals.

The effluent stream from LANL's Radioactive Liquid Waste Treatment Facility flows through Mortandad Canyon. The treatment facility discharges about 60,000 gallons of treated effluent per week. Recent improvements have greatly reduced concentrations of chemicals and radionuclides in the effluent. But legacy discharges have left behind residual contamination in canyon soils and in the shallow ground water in some areas. Because some of these residues are water soluble, they can be mobilized as water flows down the canyon. The Permeable Reactive Barrier provides a simple, inexpensive technology to help control legacy contamination.

The barrier requires no personnel or energy resources to operate. It is essentially a trap dug into the ground. Within the four walls of the 27-foot-deep barrier chamber are layers of low-cost materials— fine lava rock, calcium phosphate, pecan shells, cottonseed and limestone— specifically formulated to capture contamination. Each layer treats the water for a specific set of contaminants.

Treatment materials within the barrier will last for about ten years. After their cleaning power has been exhausted, the layers can be excavated easily and sent to an appropriate disposal facility. New materials can then be added and the barrier is good for another ten years.

The chemistry behind the treatment methods is well established and technically proven. To assess the effectiveness of the barrier, LANL environmental scientists take samples of water and materials inside the treatment box. In addition, water samples are taken upstream and downstream of the barrier for analyses.

Because nothing like the barrier has ever been used on LANL property before, Los Alamos environmental researchers will carefully monitor all aspects of the technology to determine if it would be useful in other areas and at other sites across the nation.

For more information, contact James E. Rickman at (505) 665-9203 or jamesr@lanl.gov.

EM Enhances Passive Remediation

At the Savannah River Site in South Carolina, the Oak Ridge Site in Tennessee and the Hanford Site in Washington, chlorinated solvents are contaminating soils and ground water. As these are organic contaminants, the Office of Environmental Management (EM) decided to develop an "enhanced passive" natural approach to cleaning up the soil and ground water.

EM's approach is based on findings that active remediation of organic contaminants in ground water (e.g., pump and treat) are technically not as effective as previously believed, and on the premise that nature will process organic contaminants, if given enough time. So at sites with continuing missions, EM would like to let nature clean itself, but will continually monitor the contaminated plumes to ensure that they do not migrate or pose environmental risks.

As monitoring efforts have traditionally been labor intensive and costly, EM is developing approaches that are cheaper, less cumbersome, and better indicate effective risk reduction. The enhanced monitored natural attenuation project implementation plan is in place; the project is estimated to cost $6.4 million over three years. A team of scientists, cleanup managers, and regulators at Savannah River, Oak Ridge, and Hanford will conduct the project.

The Scientific Basis for Monitored Natural Attenuation and Enhanced Passive Remediation for Chlorinated Solvents project was approved by the Assistant Secretary for EM, Jessie Roberson, as part of EM's "alternative projects" approach and step-by-step improvements to current high-risk/high-cost baseline remediation projects.

The natural remediation approach to site cleanup has become increasingly popular in cleanup remedies over the past decade, in conjunction with aggressive remediation of source terms in plumes. Less aggressive cleanup of plume fringe areas have proven to be less expensive, more effective, and more environmentally acceptable.

For more information, contact Claire Sink at Claire.Sink@em.doe.gov.

Grouting Tanks in Burial Grounds

To help protect workers and the environment, the Savannah River Site (SRS) marked a cleanup milestone this spring with the final grout placement in a radioactive underground solvent tank.

"This was an enormous task," said Ed McNamee, Project Manager. "It took almost 200 average size concrete trucks to completely fill these tanks, and each grout pour required careful planning for the hazardous radiological conditions each tank presented."

Since work began in November 2001, workers have safely placed more than 1,550 cubic yards of grout in 22 tanks. Filling the tanks with grout stabilizes them and fixes remaining contaminants in place. The tanks are located in the Old Radioactive Waste Burial Ground, which has a high concentration of radionuclides that must be shielded from the environment.

A recent Record of Decision requires the burial ground and tanks to be covered

***Grouting Tanks,** continued on page 19*

EM's Science & Technology Program Helps the Field

The Office of Environmental Management's Science and Technology program provided a technical support team to the Rocky Flats Environmental Technology Site (RFETS) to assist in improving operations while maintaining environmental health and worker safety. The technical support team developed the justification for reducing the temperature for stabilizing specific high-chloride plutonium oxides produced at the RFETS.

At the previous stabilization temperature of 950 degrees, chloride salts are vaporized, which may damage stabilization equipment and result in repair work that could increase worker exposure, generate waste and delay stabilization.

The support team reviewed existing technical data and evaluated possible alternative approaches for stabilization. They determined that a technical case could be made for lowering the stabilization temperature to 750 degrees for these specific materials. Subsequent testing showed that this stabilization condition produced material that was equivalent to stabilization at 950 degrees with respect to reactivity and moisture content while reducing furnace corrosion and formation of salt by-products. This ultimately increased worker safety and reduced financial and schedule risks.

The EM Science and Technology program is helping sites meet cleanup goals by providing teams of knowledgeable experts, reviewing baselines to identify technical risks, evaluating commercially available solutions, and in some cases, co-funding the development of innovative alternatives.

For more information contact Jeff Walker at JEFFREY.WALKER@em.doe.gov.

SSAB SPOTLIGHT

The Community Advisory Board for Nevada Test Site Programs... A Decade of Progress

Ten years ago, a group of Nevada stakeholders and the Department of Energy's (DOE) Environmental Management (EM) program began implementing new way of doing business: involving the public in cleanup decision-making. Public involvement was still a relatively new concept not only to Nevada, but also to the entire DOE complex. Approximately 120 Nevada stakeholders came forward to serve on the newly formed Citizens Advisory Board, or CAB, bringing with them a diverse set of perspectives, values and opinions relating to environmental cleanup.

Ten years later, Nevada's CAB is one of nine local Environmental Management (EM) Site-Specific Advisory Boards (SSABs) that provide advice and recommendations to the EM program at major sites across the complex.

When thinking of Nevada, most people primarily think of Las Vegas, but Nevada is a vast piece of real estate largely composed of mining, agriculture and ranching activities. Nevada's CAB currently comprises 16 men and women – 9 from Las Vegas, 1 from Reno, and the remaining 6 from small communities surrounding the Nevada Test Site (NTS). This diversity assures that a broad array of values is included in feedback to NTS program managers.

Over the years, the Board has tackled complicated issues ranging from radioactive waste transportation to long-term stewardship. Today's CAB is a seasoned, informed group focusing on three environmental management initiatives: the Underground Test Area Project (UGTA), Transportation and Waste Management, and input into the annual environmental management budget prioritization.

In addition to their ongoing focus on environmental management technical issues, CAB members also track funding issues and future budgetary impacts to the site. As a result, within the last year the CAB proactively began streamlining its efforts to get "more bang for the buck." In a state as large as Nevada, travel is a real issue for many rural CAB members. As a result, travel costs have been minimized by scheduling all committee meetings on the same day each month. Members also took a hard look at how work plans were developed and have made a concerted effort to meet semi-annually to design work plans that will support the subcommittees' ongoing work, deliverables, and feedback to the community at large. Additionally, rather than sponsoring a monthly public meeting as has been done in years past, quarterly public meetings are now conducted to coincide with deliverables and/or reporting points identified in the work plan. The outcome has been a more focused group operating at a substantially reduced cost to the taxpayer.

Carl Gertz, the Assistant Manager for EM at NTS, remarked, "I applaud the efforts of the CAB to continually seek out improved ways to work, congratulate them on their decade of volunteer service to the environmental management program, and look forward to their ongoing involvement and feedback."

The CAB has been particularly effective in impacting decisions relating to the UGTA at the Nevada Test Site. For more than 40 years, the primary mission at the Nevada Test Site was field testing of nuclear weapons. Between 1951 and 1992 a total of 828 underground nuclear tests were conducted. A primary concern of the committee is ground water contamination resulting from the historical underground testing program. Although the site developed a comprehensive modeling and investigative strategy to evaluate the extent of ground water contamination, the CAB raised questions and concerns regarding the strategy's viability for predicting potential offsite contaminant migration. As a result, the CAB requested that DOE conduct an independent peer review of the effort. After listening to the committee's concerns and rationale, project managers agreed to fund an independent peer review of the UGTA strategy. The site has since implemented several recommendations of the peer review, continues to work with the UGTA Committee, and has even taken it one step further.

"Although we think we're heading in the right direction, there is always room for improvement and opportunities for fresh perspectives," Gertz added. "Given the CAB's years of focus on this activity, I invite them to provide me their best recommendations for siting a future monitoring/characterization well at the site that will provide additional information to surrounding communities."

For ten years the CAB has been making a difference at the Nevada Test Site and now is doing it more efficiently than ever.

For more information, visit the CAB's Web site at www.ntscab.com.

LLNL Environmental Leader Named to Women's Hall of Fame

Ellen Raber of the Lawrence Livermore National Laboratory (LLNL) has been named to the Women's Hall of Fame for her contributions to the environmental field.

Raber is head of LLNL's Environmental Protection Department and a national leader in research and development efforts in pollution prevention, waste management, environmental restoration and environmental monitoring and analysis.

Raber has led the effort to accelerate the opening of LLNL's state-of-the-art Decontamination and Waste Treatment Facility that replaces an older World War II era facility. She has been a strong proponent of ensuring that LLNL operates the best environmental facilities to protect its workers and the community.

Raber has also recently led the development of a decontaminating gel that is effective against chemical and biological warfare agents but then breaks down to environmentally acceptable byproducts. The patented gel is available for use in civilian facilities in response to a terrorist incident or in the case of an accidental release of a biological or chemical agent.

In her 22 years at LLNL, Raber has used her background in geochemistry to resolve a variety of environmental issues related to geothermal resources, underground coal gasification, the strategic petroleum reserve and nuclear waste management. She has also worked on technology to provide award-winning solutions for chemical weapons treaty verification and intelligence community applications.

On March 8, 2003, she was honored during the 10th Annual Women's Hall of Fame Awards Ceremony in Oakland, California.

For more information, contact Albert Lamarre at lamarre1@llnl.gov.

***Grouting Tanks,** continued from page 17*

with a protective synthetic cap followed by a layer of soil and vegetation to complete final closure. Capping the unit protects workers from possible exposure if more invasive processes had been used.

These tanks were used until the mid-1970s to store spent radioactive solvent and aqueous wastes generated from the plutonium/uranium extraction process. The burial ground, last used in 1974, is a 76-acre radioactive waste disposal area. The greatest volume of the waste was low-level incidental waste from laboratory and production operations. It was placed in drums, cans, cardboard boxes, plastic bags, and metal containers and buried in earthen trenches about 20 feet deep. The cap will prevent intrusion of rainwater and limit potential migration of the contaminants.

Completing the tank closures allows SRS personnel to finish plans for the final closure actions at the burial ground complex, which are scheduled to begin in December 2003.

For more information, contact Fran Poda at (803) 208-3925.

SRS Conference Involves the Community

The fourth Annual Bi-State Conference on the Savannah River Site (SRS) was held on March 15, 2003, at Savannah State University with more than 140 people in attendance. The purpose of the conference was to inform and educate the participating communities in Georgia and South Carolina about activities and new missions associated with operations and actions at the Savannah River Plant and to provide a forum for questions and answers.

The Keynote speaker for the event was Jeff Allison, Manager of the Savannah River Operations Office. He informed the community that SRS is evolving over time.

"We're trying to work toward finishing the Environmental Management mission by focusing on our most critical risks," he said. Allison expressed the importance of public participation and community involvement and added, "A key part of that public participation and community involvement activity is the effort we take to understand and support the concept of Environmental Justice at SRS. We want to ensure that our plans, programs and actions do not disproportionately affect those members of the community who may have been overlooked or left out of the decision-making processes that have guided our operations. We are committed to bringing everyone who may be interested in our operations to the table and to taking the extra steps necessary to inform and to learn."

For more information, contact Louisiana Wright at (803) 502-9982.

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